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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/588,935

Applicant(s)

IWASAKI, OSAMU

Examiner

Danielle Dunn

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Applicant's amendment filed on 1/29/2008 has been entered. Claims 1, 3, 20, 21 and 24 have been amended. No claims have been cancelled. Claims 25 and 26 have been added. Claims 1-26 are still pending in this application, with claims 1, 3, 20, 21, 24 and 25 being independent.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-3, 5-18, 21, 23, 25 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426), and further in view of Furukawa et al. (JP 05-249320).

With respect to **claims 1-3, 5, 6, 21, 23, 25 and 26**, Aihara et al. teach a transparent light guide plate having a rectangular light exit surface (light guide plate 11 has a rectangular light exit surface; Drawing 1). Aihara et al. teach a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing side of said thick portion (clearly shown in Drawing 1). Aihara et al. also teach the thin edge portions being formed in parallel on both sides of said thick

portion (looking at the two sides of Drawing 1, one can see both the parallel sides have thin edge portions). Aihara et al. also teach a parallel groove (slot 14) which accommodates a bar-like light source (fluorescent tube 12) and is formed at substantially a center of said thick portion in parallel with two opposing sides (Drawing 1).

Aihara et al teach inclined rear portions (shown in Drawings 1 and 2) which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface, and whose thickness is reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of parallel groove (Drawings 1 and 2). Aihara et al. teach an end portion of said parallel groove being narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface (shown in Drawings 1 and 2).

Aihara et al. teach the light guide plate being formed of a single material, thereby having a uniform index of refraction (Drawing 1). Aihara et al teach the end portion forming an angle of 90 degrees or less, with the angle being obtained by combining two angles between both sides of said sectional shape of said parallel groove and a perpendicular line extending from a center of said bar-like light source toward said rectangular light exit surface (Drawings 1 and 2). Aihara et al. teach the end portion forms an angle of 60 degrees or less, said angle being obtained by combining two

angles between both sides of said sectional shape of said parallel groove and a perpendicular line extending from a center of said bar-like light source toward said rectangular light exit surface (Drawings 1 and 2).

Aihara et al. do not explicitly teach a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions. However, Furukawa et al. teach an end portion of said parallel groove being narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface, in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions (the end portions of the dead air space for light sources 8 is narrowed toward the optical diffusion layer 3 the V-shaped groove accounts for the claimed ratio, i.e. rise over slope; Fig. 5).

Furukawa et al teach the inclined rear portions thickness being reduced from said thick portion toward said thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove,

wherein an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface (Fig. 5), in such a manner that a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove is three or less times as large as an average value of said illuminance or luminance of said emitted light at a second portion corresponding to said inclined rear portions (the end portions of the dead air space for light sources 8 is narrowed toward the optical diffusion layer 3; Fig. 5).

Furukawa et al. also teach a bar-like light source (light source 2) accommodated in the parallel groove of the light guide plate, a reflector (light reflex object 2a) provided behind said bar-like light source to cover said parallel groove, a reflective sheet provided on said inclined rear surfaces of said inclined rear portions on both sides of said thick portion of said light guide plate (low refractive-index layer or high reflection factor layer 4), and a diffusion sheet arranged on said rectangular light exit surface of said light guide plate (optical diffusion layer 3).

Therefore at the time of the invention, it would have been obvious to one skilled in the art to modify the slot of Aihara et al. to be V-shaped as taught by Furukawa et al. because this increases the luminance of the device. It would have been obvious to have the end portion of said parallel groove is symmetrically narrowed such that a peak value

of relative illuminance or relative luminance at said first portion of said rectangular light exit surface is three or less times as large as an average value of said relative illuminance or relative luminance at said second portions of said rectangular light exit surface because this would allow one to equalize the luminance of the backlight unit as needed. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only ordinary skill in the art. *In re Aller*, 105 USPQ 233.

With respect to **claims 7-17**, Aihara et al. teach the sectional shape of the end portion of the parallel groove being defined by part of two straight lines symmetrical with respect to the center line of the parallel groove which intersect at a peak (the upper part of the slot is the peak where the two straight lines intersect; Drawings 1 and 2). Aihara et al. teach the sectional shape at the top of said end portion of said parallel groove having a portion parallel with said rectangular light exit surface where said intersection as the peak is chamfered (Drawing 2). Aihara et al. do not explicitly teach the sectional shape of the end portion of the parallel groove being defined by part of two curved lines symmetrical with respect to the center line of the parallel groove that cross each other at an intersection as a peak. However, Furukawa et al. teach the sectional shape of the end portion of the parallel groove being defined by part of two straight or curved lines symmetrical with respect to said center line of said parallel groove, which cross each other at an intersection as a peak (Drawings 3 and 5). Furukawa et al. also teach two curved lines defining the sectional shape of the end portion of the parallel groove being

convex or concave with respect to said center line of said parallel groove (Drawings 3 and 4). Furukawa et al. teach two curved lines defining the shape of the end portion of the parallel groove being convex or concave with respect to said center line of said parallel groove (Fig. 3 and 4).

Furukawa et al. teach two curved lines defining the sectional shape of the end portion of the parallel groove or the sectional shape of said parallel groove comprising part of circular, elliptical, parabolic, or hyperbolic lines, which are convex or concave with respect to said center line of said parallel groove (Fig. 3 and 4). Furukawa et al. teach the sectional shape of at least said end portion of said parallel groove or the sectional shape of said parallel groove being triangular (shown in Figs. 1, 2 and 5). Furukawa et al. teach the sectional shape at a top of said end portion of the parallel groove being defined by said two straight or curved lines symmetrical with respect to said center line cross each other and a straight or curved line symmetrical with respect to said center line which is connected to said two straight or curved lines before said two straight or curved lines cross each other (Figs. 3 and 5).

Furukawa et al. teach the sectional shape at the top of the end portion of the parallel groove being a curved shape symmetrical with respect to the center line and convex or concave with respect to the rectangular light exit surface (Figs. 3 and 4). Furukawa et al. teach the sectional shape at the top of the end portion of the parallel groove being a circular, elliptical, parabolic, or hyperbolic shape obtained by rounding said intersection as the peak symmetrically with respect to said center line (Figs. 3 and

4). Furukawa et al. teach the sectional shape of the end portion of the parallel groove being defined by part of an elliptical or hyperbolic line (Fig. 3).

Regarding the parallel groove being approximated by a tenth-order mathematical function, the applicant is advised that, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964, (Fed. Cir. 1985). In this case, the cited limitations failed to distinguish the claimed structure from the patented lightguide of Furukawa et al. See MPEP § 2113. Therefore, at the time of the invention, it would have also been obvious to modify the slot of Aihara et al. to include the different shapes of Furukawa et al. because this allows for different size lights to be accommodated in the device.

It would have been obvious to one skilled in the art at the time of the invention to modify the dead air space of Furukawa et al. to have a trapezoidal shape symmetrical with respect to said center line, since it has been held by the courts that a change in shape or configuration, without any criticality, is nothing more than one of numerous shapes that one of ordinary skill in the art will find obvious to provide based on the suitability for the intended final application. See *In re Dailey*, 149 USPQ 47 (CCPA 1976). It appears that the disclosed device would perform equally well shaped as disclosed by Furukawa et al.

With respect to **claim 18**, regarding the groove being sanded, the applicant is advised that, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964, (Fed. Cir. 1985). In this case, the cited limitations failed to distinguish the claimed structure from the patented lightguide of Furukawa et al. See MPEP § 2113.

3. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426) and Furukawa et al. (JP 05-249320) as applied to claim 3 above, and further in view of Kunishige (JP 11-149073).

With respect to **claim 4**, Furukawa et al. teach all the limitations as disclosed above. Furukawa et al. do not explicitly teach having the peak of relative illuminance or relative luminance at said first portion of said rectangular light exit surface is twice or less as large as said average value of said relative illuminance or relative luminance at said second portion of said rectangular light exit surface. However, Kunishige teaches equalizing the outgoing radiation luminance distribution of a light guide plate (Para 29). Therefore, it would have been obvious to have the peak of relative illuminance or relative luminance at said first portion of said rectangular light exit surface is twice or

less as large as said average value of said relative illuminance or relative luminance at said second portion of said rectangular light exit surface because this would allow one to equalize the luminance of the backlight unit as needed. Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only ordinary skill in the art. *In re Aller*, 105 USPQ 233.

4. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426) and Furukawa et al. (JP 05-249320) as applied to claim 1 above, and further in view of Ide et al. (US 2003/0120210).

With respect to **claim 19**, Aihara et al. and Furukawa et al. teach all the limitations as disclosed above. However, Aihara et al. and Furukawa et al. do not explicitly disclose a halftone dot pattern being formed in a portion of the rectangular light exit surface corresponding to the top of the end portion of the parallel groove. However, Ide et al. teach a random dot pattern 106 being formed in a portion of a light guide plate 108 shown in Fig. 2 (Para 16; lines 1-15). It would have been obvious to one skilled in the art at the time of the invention to modify the device of Aihara et al. and Furukawa et al. to include the random dot pattern of Ide et al. because it generates a reduction of moiré.

5. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Aihara et al. (JP 08-062426) and Furukawa et al. (JP 05-249320) as applied to claim 21 above, and further in view of Yokoyama et al. (US 5,402,324).

With respect to **claim 22**; Aihara et al. and Furukawa et al. teach all the limitations as described above. Aihara et al. and Furukawa et al. do not explicitly teach the planar lighting device further comprising a prism sheet arranged between said rectangular light exit surface of said light guide plate and said diffusion sheet. However Yokoyama et al. teaches a prism sheet 7 being arranged between a rectangular light exit surface (liquid crystal panel 5) of said and a diffusing member 3. It would have been obvious to one skilled in the art at the time of the invention to modify the device of Aihara et al. and Furukawa et al. to include the prism sheet of Yokoyama et al. because satisfactory brightness can be maintained.

6. **Claim 20 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunishige (JP 11-149073).

With respect to **claim 20**; Kunishige teaches light guide plate formed from two or more light guide plates each comprising a rectangular light exit surface (display panel 1), a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing two sides of said rectangular light exit surface (Fig. 2), and thin edge portions formed in parallel on both sides of said thick portion (light guide plates 4, 5 have thin edge portions; Fig. 2). Kunishige also teaches a parallel groove which accommodates a bar-like light source and is formed at substantially a

center of said thick portion in parallel with said opposing two sides (shown in Fig. 2) and inclined rear portions which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface (inclined rear portions are shown in Fig. 2). Kunishige teaches the inclined rear portions thickness being reduced from the thick portion toward the thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove (the thickness of the light guide plates 4, 5 are reduced from the thick portion toward the thin edge portions; Fig. 2), wherein an end portion of said parallel groove is narrowed toward said rectangular light exit surface symmetrically with respect to a center line of said parallel groove perpendicular to said rectangular light exit surface in a sectional shape of said parallel groove in said direction perpendicular to said rectangular light exit surface (Fig. 2), in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions, and wherein said two or more light guide plates are connected with each other at said thin edge portions thereof. It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect two or more light guide plates with each other at the thin edge portions, since it has been held that forming in one piece a structure which has formerly been formed in two, or more pieces, involves only routine

skill in the art. *In re Larson*, 144 USPQ 347, 349 (CCPA 1965).

With respect to **claim 24**, Kunishige teaches a liquid crystal display device comprising a backlight unit (Fig. 6) including a planar lighting device. Kunishige teaches a liquid crystal display panel arranged on a light exit surface side of said backlight unit (display panel 1), and a drive unit (energization member 8) driving said backlight unit and the liquid crystal display panel. Kunishige teaches the planar lighting device comprising a light guide plate (light guide plate 4, 5) with a rectangular light exit surface (Fig. 2), a thick portion positioned at substantially a central portion of said rectangular light exit surface in parallel with opposing two sides of said rectangular light exit surface (Fig. 2), and thin edge portions formed in parallel on both sides of said thick portion (light guide plates 4, 5 have thin edge portions; Fig. 2). Kunishige teaches a parallel groove which accommodates a bar-like light source and is formed at substantially a center of said thick portion in parallel with said opposing two sides (shown in Fig. 2) and inclined rear portions which are symmetrical with respect to a plane including a central axis of said bar-like light source and perpendicular to said rectangular light exit surface (Fig. 2). Kunishige teaches the inclined rear portions thickness being reduced from the thick portion toward the thin edge portions in a direction perpendicular to said opposing two sides to thereby form inclined rear surfaces on both sides of said parallel groove (the thickness of the light guide plates 4, 5 are reduced from the thick portion toward the thin edge portions; Fig. 2). Kunishige teaches an end portion of the parallel groove being narrowed toward the rectangular light exit surface symmetrically with respect to a

center line of the parallel groove perpendicular to the rectangular light exit surface in a sectional shape of said parallel groove in a direction perpendicular to the rectangular light exit surface (Fig. 2), in accordance with a ratio of a peak value of illuminance or luminance of emitted light from said bar-like light source accommodated in said parallel groove at a first portion of said rectangular light exit surface corresponding to said parallel groove to an average value of said illuminance or luminance of said emitted light at second portions corresponding to said inclined rear portions. Kunishige teaches a bar-like light source (light source 3) accommodated in the parallel groove of the light guide plate, a reflector provided behind said bar-like light source to cover said parallel groove (reflecting plate 7, Fig. 2); a reflective sheet provided on said inclined rear surfaces of said inclined rear portions on both sides of said thick portion of said light guide plate (reflecting plate 7); and a diffusion sheet arranged on said rectangular light exit surface of said light guide plate (diffusion member 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect two or more light guide plates with each other at the thin edge portions, since it has been held that forming in one piece a structure which has formerly been formed in two, or more pieces, involves only routine skill in the art. *In re Larson*, 144 USPQ 347, 349 (CCPA 1965).

Response to Arguments

7. Applicant's arguments filed 1/29/2008 have been fully considered but they are not persuasive.

8. Applicant's arguments with respect to claims 1, 3 and 21 have been considered but are moot in view of the new ground(s) of rejection.
9. Regarding the Examiner's rejection of claims 2, 4-19, 22 and 23, the applicant present no arguments, except stating that such claims depend directly or indirectly from independent claims 1, 3 and 21 and would be allowable when/if the independent claims are allowed.
10. Regarding claims 20 and 24, in response to applicant's argument that Kunishige fails to teach two or more light guide plates being connected together with each other at the thin edge portions, the applicant is advised that it has been held that the term "*integral*" is sufficiently broad to embrace construction means such as fastening and welding. *In re Hotte*, 177 USPQ 326, 328 (CCPA 1973).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Danielle Dunn whose telephone number is (571)270-3039. The examiner can normally be reached on Monday thru Friday 9:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 571-272-2378. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sandra L. O'Shea/
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